949 Exercise Evaluation of Myocardial Ischemia

Monday, March 17, 1997, 3:00 p.m.–5:00 p.m.
Anaheim Convention Center, Hall E
Presentation Hour: 4:00 p.m.–5:00 p.m.

949-25 Does Nuclear Testing Yield Incremental Information for the Prediction of Death in Patients with Normal Rest ECG: A Multicenter Study of 5554 Patients With Stable Angina

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The incremental prognostic value of SPECT over clinical information in patients with normal rest ECG for the prediction of cardiac death is not known. To this end, we identified 8408 consecutive patients (pts) who underwent exercise stress SPECT at 6 centers, 5554 of whom had normal rest ECG (NL: mean age = 64; 64% male; 19% previous MI). In the NL group, 62 cardiac deaths (1.1%) were noted over a mean follow-up of 2.6 + 1.5 years. Clinical and exercise information were combined using a validated composite variable. Perfusion variables examined included the number of coronary artery territories with reversible (REV) or fixed (FXD) defects. Using a multivariable Cox proportional hazards analysis, in the cohort of 8408 pts, a normal rest ECG was not predictive of outcome after adjustment for clinical and nuclear data. A similar analysis in the subgroup of 5554 pts with NL, noted a significant incremental gain in $\chi 2$ with the addition of nuclear data; 56% of the data in the final model was derived from nuclear variables ($\chi 2$: clincal 25, #REV 36, #FXD 22, Global 103; all $p < 0.0001$). The relative risk conferred by two and three REV were 3.5 and 6.3, respectively, and by two and three FXD were 4.7 and 5.5. *Conclusion:* SPECT adds incremental information for the prediction of cardiac death in patients with NL even after adjusting for clinical and exercise factors. Both REV and FXD are prognostically predictive.

949-26 Validation of the Exercise-Treadmill Score Designed From Mark in Stable Patients With Old Myocardial Infarction

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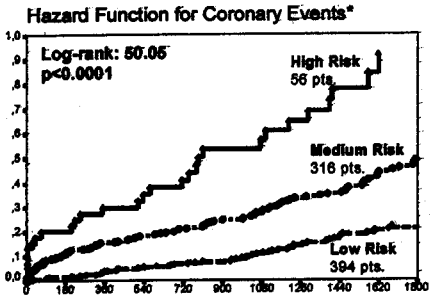
In order to assess if the exercise-treadmill score designed by Mark [exercise time-(5 x ST deviation)-(4x angina index)] and originally applied in patients (pts.) with CAD could also predict prognosis of stable out-pts. late from a Q wave myocardial infarction (AMI), 766 consecutive pts. who underwent symptom-limited treadmill test (Bruce) at least 1 year after AMI (mean: 34 ± 9 month) were considered. 3 different groups were identified: 1) *High risk:* 56 pts. (8%); 2) *Medium risk:* 316 pts. (41%); 3) *Low risk:* 394 pts. (51%). Clinical, exercise indexes and a 5-year follow-up were studied.

Risk class	Global death RR (CI 95%)	Fatal or Non-fatal Re-AMI RR (CI 95%)	Unstable angina RR (CI 95%)	PTCA/CABG RR (CI 95%)
High risk:	1.71 (0.81–3.59)	1.3 (0.53–3.14)	2.74 (1.99–3.75)	2.4 (1.54–3.73)
Medium risk:	1.57 (0.95–2.58)	1.84 (1.07–3.13)	1.34 (1.01–1.79)	1.62 (1.13–2.33)
Low risk:	0.51 (0.30–0.87)	0.48 (0.27–0.85)	0.46 (0.34–0.64)	0.40 (0.27–0.60)



Therefore the treadmill score tested, although originally designed for pts. with suspected CAD, could be useful also in out-pts. With old AMI who are referred to exercise test for routine evaluation. In this low risk population, the score can separate a small subset of pts. that should be sent directly to angiography from a large, very low risk group that need only a clinical follow-up. This should allow to shift resources (stress echo, thallium scan) to the large cohort of medium risk's pts. that deserves special care to improve the risk stratification.

949-27 Prognostic Value of Exercise-Redistribution-Reinjection Thallium SPECT and Low-Dose Dobutamine Echocardiography in Left Ventricular Ischemic Dysfunction

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Both exercise-redistribution-reinjection thallium SPECT (Tl) and low-dose dobutamine echo (DbE) allow prediction of functional recovery after revascularization (RVS) in patients (pts) with chronic LV ischemic dysfunction. To investigate the prognostic value of these tests, 137 consecutive coronary pts with an ejection fraction of 35 ± 12% who underwent both Tl and DbE to assess myocardial viability were followed up for a median of 32 months. RVS was performed in 94 pts (72 by surgery, 22 by PTCA) and 43 pts were treated medically (MED). Criteria to define viability with Tl were a Tl uptake > 50% at reinjection and with DbE an improved wall motion in 2 adjacent akinetic segments. Four groups of patients were defined according to treatment strategy and results of viability studies. During follow-up, 24 pts died of cardiac causes. Table shows their distribution among the 4 groups.

	Tl viable	Tl nonviable	DbE viable	DbE nonviable
RVS	5/58 (9%)#	8/36 (22%)	3/60 (5%)#*	10/34 (29%)
MED	4/16 (25%)	7/27 (26%)	7/29 (24%)	4/14 (29%)

*$p < 0.05$ vs. respective viable MED; # $p < 0.05$ vs. respective nonviable

Kaplan Meier survival curves indicated better prognosis in pts with viable myocardium undergoing RVS than in the 3 other groups ($p < 0.05$). Cox analysis identified the number of diseased vessels ($p = 0.001$), diabetes ($p = 0.002$), viability by DbE ($p = 0.003$) and treatment strategy ($p = 0.02$) as independent predictors of long term prognosis. Our data suggest that, in pts with chronic LV ischemic dysfunction, assessment of myocardial viability may help to define long term prognosis and to design the optimal therapeutic option.

949-28 Effect of Dobutamine on the LV Time Constant of Isovolumic Relaxation During the Development of Myocardial Ischemia

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During the development of myocardial ischemia, abnormalities of diastolic function occur before abnormalities of systolic function. The effect of dobutamine (DOB) on the LV time constant of isovolumic relaxation (τ) *during the development of ischemia* may be important, as noninvasive measurement of τ during DOB stress testing could improve the detection of early ischemia. Graded doses of DOB were infused in 8 open-chest dogs under control conditions (-S) and then after creation of an LAD stenosis (+S) which attenuated reactive hyperemia, with DOB infusion terminated upon the earliest recognition of an anterior wall motion abnormality by echo. HR, micromanometer LV pressure (mmHg), peak (+) LVdP/dt indexed to developed isovolumetric pressure (+dP/dt/IP, sec^{-1}), and τ (ms) were measured before and during peak dose (+DOB).

	HR	LVEDP	LVESP	(+)dP/dt/IP	τ
−S	122 ± 8	6 ± 2	88 ± 5	23 ± 1	51 ± 5
−S+DOB	169 ± 9#	7 ± 2	107 ± 20	40 ± 6#	23 ± 3#
+S	119 ± 8	7 ± 2	88 ± 7	23 ± 2	53 ± 3
+S+DOB	164 ± 7*	6 ± 2	87 ± 11	39 ± 5*	38 ± 4*†

#$p < 0.05$ vs. −S, *$p < 0.05$ vs. +S, †$p < 0.05$ vs. −S+DOB

Results: DOB (peak dose 22 ± 4 μg/kg/min) resulted in a decrease in τ during both control and stenotic conditions. However, the decrease in τ with stenosis was less than that observed during control, despite equivalent responses of HR, loading conditions, and global systolic performance. *Conclusion:* Regional ischemia induced by DOB is associated with significant alterations in global LV relaxation. Noninvasive measurement of this index of diastolic function during DOB stress testing may assist in the detection of ischemia, which may be of particular help when wall motion abnormalities are small or subtle.